Introduction to…..
Manufacturing at Toyota

Lean Thinking….Unveiling the Toyota Production System

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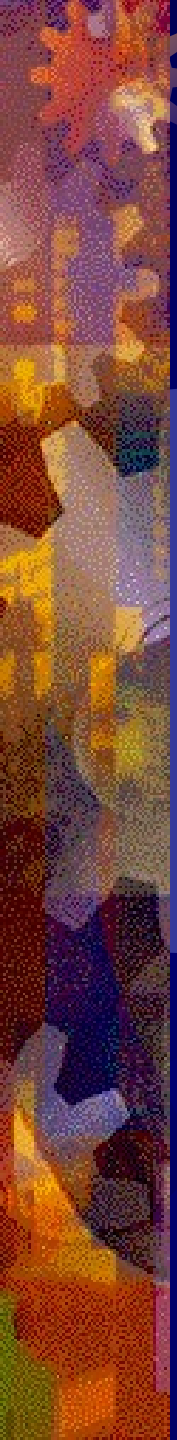


Historical Background of Toyota Management Philosophy

Company Crisis in 1950

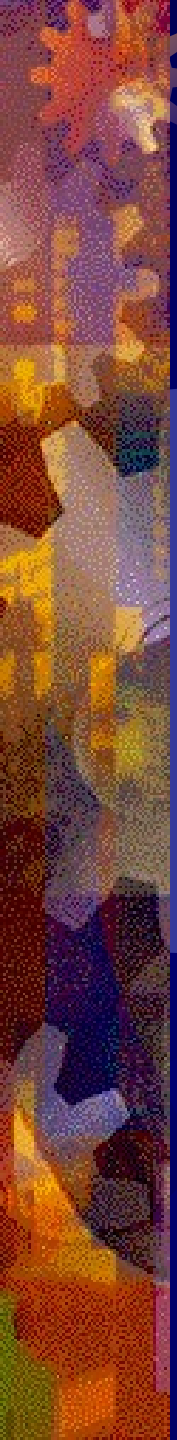
- Large number of employees were laid off due to worst sales in its history
- The founder/president of Toyota

Kiichiro Toyoda
Founder of Toyota Motors

- **Labor & Management Conflict**
  - **Mutual trust was lost**
- **Restoring Mutual Trust**
  - **One-on-one communication between management and**

Taizo Ishida
2nd President of Toyota Motors

- **Commitment from Labor & Management**
  - **Never to experience lay-offs again**
  - **Labor & Management to work**



TMMK is Operated by TPS Philosophy

The Origin of TPS Philosophy

- **We protect our own castle:**
  - Products that consumers trust will sell
  - A company should operate with no-debt (Even a penny should not be spent if not necessary)

The TPS Way of Thinking

Traditional corporation

Price = Cost + Profit

Toyota Philosophy

Profit = Price – Cost

Eliminate the 3M's

- Overburden

- Fluctuation

- Waste

Eliminate The 7 Types of MUDA

- Over Production
- Waiting
- Conveyance
- Processing
- Inventory
- Motion
- Correction

The Origin of TPS Philosophy

- **The foundation of a strong company is mutual trust of T/Ms and management:**
  - Company's success and T/Ms' well-being are like left and right wheels of a car
  - T/Ms understand the company's goals and are committed to work toward accomplishing them
  - Improve team members' lives

Our People

- Over 7000 team members
- Diverse workforc
- No previous manufacturing experience

Selection System

- Selected for success in TPS environment
- People who can:
  - ✓ Learn new things
  - ✓ Identify and solve problems
  - ✓ Work well in teams
  - ✓ Communicate

Toyota Production System

"The manufacturing system developed by Toyota which pursues optimum streamlining throughout the entire system through the thorough elimination of MUDA (non-value added) and aims to build quality in at the manufacturing process while recognizing the principle of cost

What Does TPS Do For Us?

- **It ensures that we:**
  - Produce our product in the most efficient way
  - Produce only quality products
  - Deliver the product to our customers on-time

Toyota Philosophy

- **Customer First!**
- **Respect for humanity**
- **Elimination of waste**

TPS

Teamwork

Standardization

The process of establishing the repeatability and predictability of Man, Material, Method and Machine in work which, when properly maintained forms the basis from which improvement can be made.

TPS

- **Standardized work**
  - You gain consistency, not quality
  - Consistency exposes the problems
  - Kaizen the standard – find a better way

4S

- 4S is fundamental to TPS
- 4S is all about standards
- Everything has place

4-S

Go through your things and decide what you do and don’t need and get rid of what you don’t

4-S

Seiton (Sorting)

The orderly storage in the right place of all necessary items so that they can be easily found and used whenever needed. “A place for everything and everything

4-S

Seiso (Sweeping)

Keep your worksite clean making work easier and safer

4-S

The overall cleanliness and neatness that results from strict observance of the other 3-S’s

Kaizen

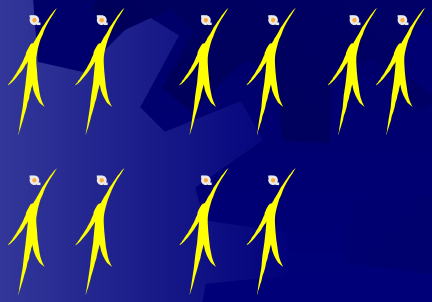
- **Don’t go for the home run!**
- **A penny saved is a penny earned.**
- **Environment**
- **Bass boat kaiz**
  - Ergonomics
  - Get rid of hidde work

Kaizen

- **Manpower kaize**
  - Team members know best ways to be productive
  - Manpower kaizens eliminate po sitions
  - Takes strong faith and trust in management

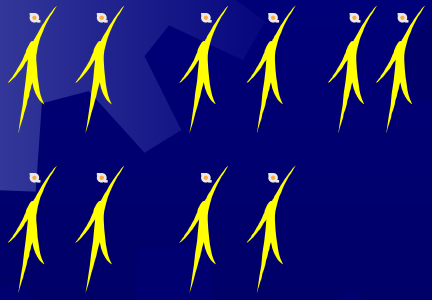
True Efficiency vs. Apparent Efficiency

Shift Requirements = 100 Parts



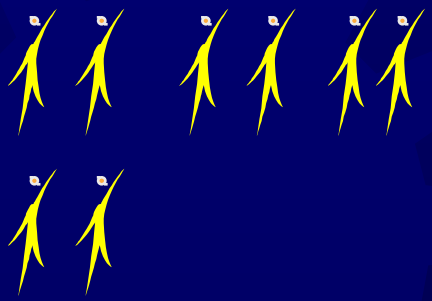
Current Situation:

10 Team Members, 100 parts per shift



Apparent Efficiency:

10 Team Members, 120 parts per shift



True Efficiency:

8 Team Members, 100 parts per shift

Solving to the Root Cause

- **An early lesson in TPS:**
  - Assembly blames Pain
  - Stick to the standards
  - Ask the Five Why's
  - Root cause: Body Sho

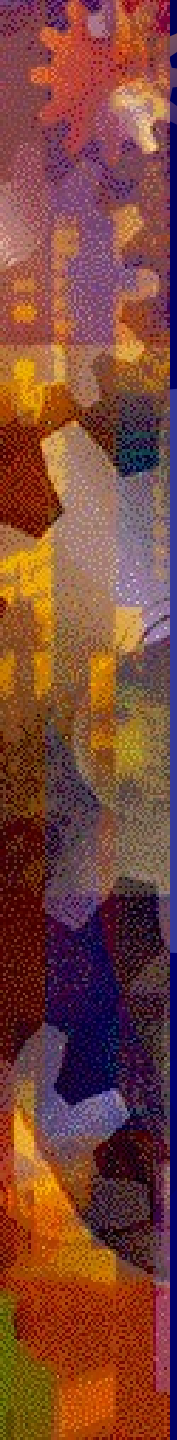
A Penny Saved Is a Penny Earned

But, at TMMK:

One Penny
X 7,000 Team Members
X 500,000 Cars/Year
$35,000,000 / Year

Quality

- Put Quality Control in the hands of every team member
- Quality drives productivity
- Productivity lowers costs



Jidoka

"The Tool of Built-in Quality"

"The ability of production lines to be stopped in the eventuality of such problems as equipment malfunctions, quality problems or work being late, either by machines which have the ability to

The Benefits of Jidoka

- Defects are NOT PASSED on to the next process (the “Customer”)
- Equipment breakdown is prevented because problems and their causes become immediately apparent
- Machine work is separated from Human Work so that team members can operate multiple machines

Tools of Jidoka

- Automatic machine shop
- Pokayoke
- Andon / Fixed position lin e-stop

Automatic Machine Stop

Pokayoke

Mistake Proofing

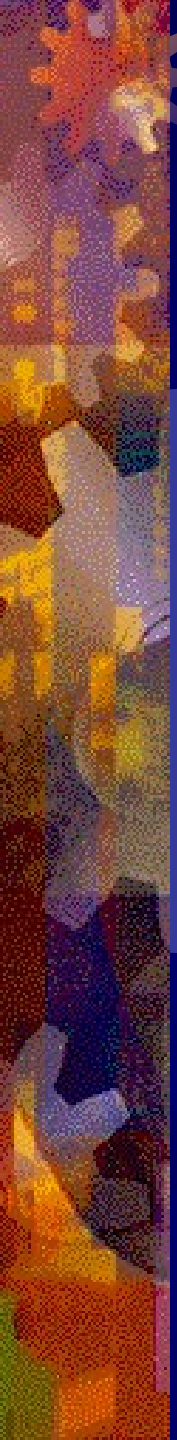
Highly reliable low-cost devices or innovations that:

- Detect abnormal situations before they occur at a production process or…

- Stop the machines or equipment and prevent the production of defective products

Conditions Required For Pokayoke

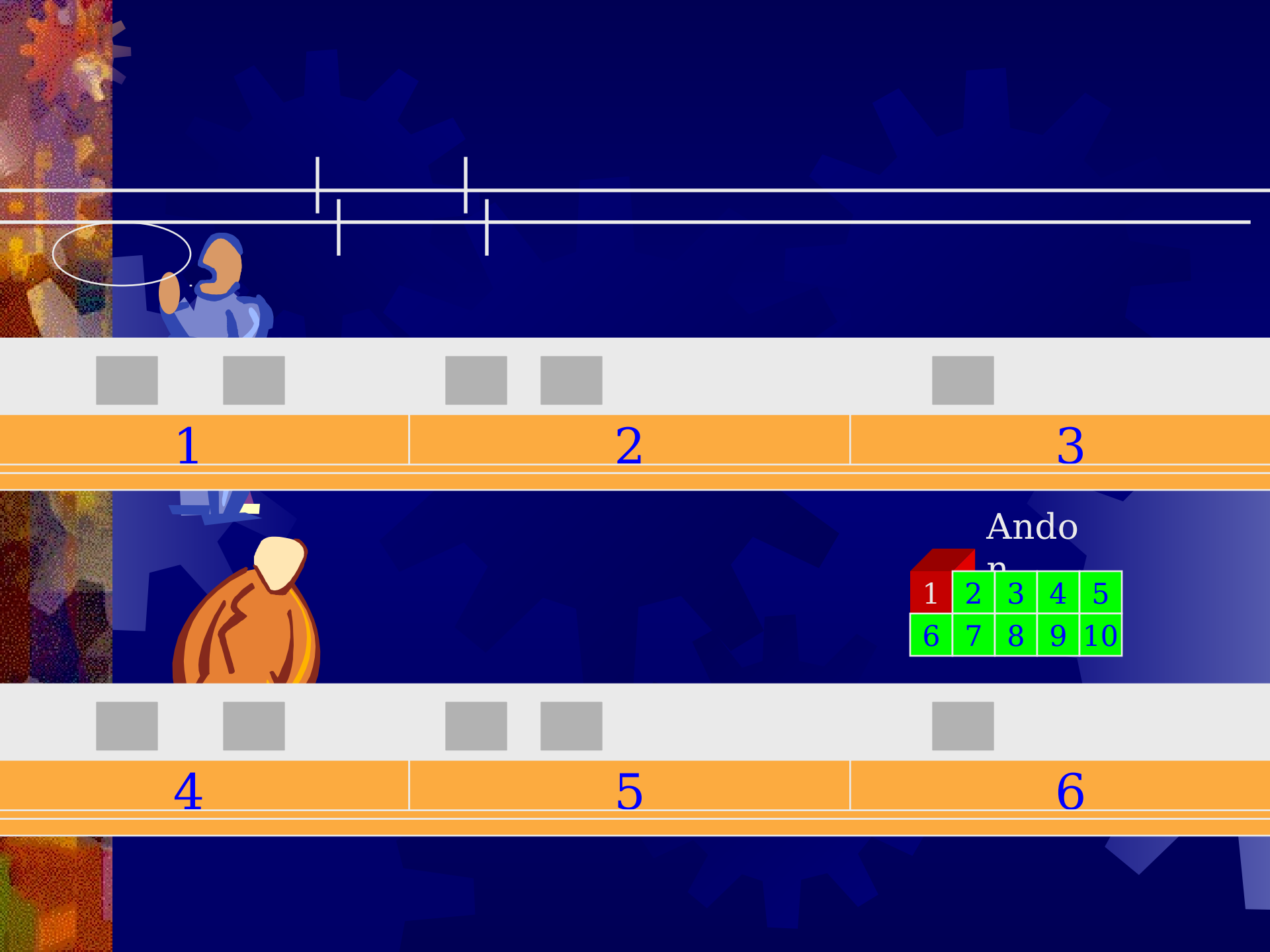
- The goal is zero defects
- Design must be based on the actual worksite conditions
- Devices must be economical
- Devices must be simple with long life and low maintenance



Andon

A device used to draw attention to any abnormality in the Production Process

Andon Cord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Communication

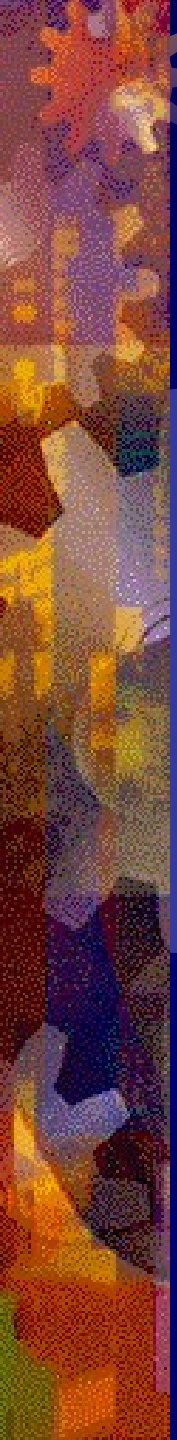
- People are the heart of TPS, and the secret to Toyota's success

- People solve problems together, through good communication

Promoting Communication

- Meetings, meetings, meetings
- Don’t build walls between people
- Meetings with all levels
- Meetings all across the organization
- No special dress or privileges for managers

Secret to Success



Thank You